



Water on the wrong side of the levee?

Full Mitigation Best Practice Story

Snohomish County, Washington

Snohomish County, WA - Severe flooding in western Washington State in early January 2009, brought on by heavy rainfall and warm temperatures that melted December's snow, posed the first test for the flood drainage gates installed 15 months earlier in the levee along the lower Stillaguamish River ("Old Stilly") south of Stanwood. The floodgates passed that test with "flying colors," according to Max Albert of the Stillaguamish Flood Control District (SFCD). Albert was referring to how quickly – in about half the time as during previous floods – that floodwaters trapped behind the levee drained through the gates and off Marine Drive and the Burlington Northern Santa Fe (BNSF) railroad tracks.



The Stillaguamish River floods approximately every three years, with overbank flows and extensive inundation of the floodplain. Floodwaters that overtop the north bank of the Stillaguamish below Silvana naturally flow northwesterly down the valley toward Stanwood. Historically, these floodwaters drained back to the river through Irvine Slough, a wide natural floodway and the shortest distance to saltwater. As development in Stanwood and the lower part of the river basin proceeded, however, obstructions to flow in this floodway reduced its capacity and the efficiency with which the slough could carry water back to the river. Millions of cubic feet of floodwaters, trapped between the north valley wall and the river levees, backed up the valley south of Stanwood. Water levels rose rapidly, commonly by more than three feet per hour, and after the flood crest the water drained out slowly over a period of several days.

The trapped floodwaters had several effects, ranging from inconvenience to costly damages, including extended closures of the BNSF railway line and Marine Drive, which is traveled by more than 5,000 vehicles each day; recurring damage and potential failure of city and SFCD levees; saturation of agricultural fields; stranding of salmon; and prolonged isolation of residents, posing risks to health and safety.

The SFCD, which maintains the levees and drainage systems in a 6,000-acre area of the lower valley between Silvana and Stanwood, was formed in 1992. In 2005, in an effort to eliminate or at least lessen the effects of future floods, the SFCD proposed construction of a flood drainage gate in the existing levee of the Stillaguamish River Old Channel near Stanwood. With a grant from the Federal Emergency Management Agency (FEMA), \$30,000 from the City of Stanwood, and technical assistance from Snohomish County, the SFCD built the "Old Stilly Gate" in September 2007. The "gate" consists of a 130-foot-long concrete section, with 10, 5-foot by 10-foot, top-hinged hatches installed within the levee. A riprap (large angular rock) apron protects the levee bank on the discharge (river) side. The floodgate is self-actuating: If the water level behind the levee is higher than the river, the hatches open and water drains to the river. If the river is higher than the water behind the levee, the hatches close to prevent flooding from the river.

In January 2009, sustained overtopping of the mainstem Stillaguamish River below Silvana posed the first test of the new Old Stilly Gate. After the river crested at Stanwood in the evening of January 8th, the floodgate was able to discharge an estimated 80 million cubic feet – or more than 600 million gallons – back to the river in just 36 hours. Marine Drive was reopened and flooded farmland was drained in less than half of the time – usually three to four days – than it took in previous floods. The BNSF was able to run their trains within 24 hours, and railroad officials, as well as upstream property owners, were pleased with the successful operation of the floodgates. They all agreed with Max Albert that the gates had passed their first test with flying colors.

The cost of damages to roads, the railroad, and adjacent farmland in previous floods along the lower Stillaguamish River have ranged from \$225,000 to \$250,000; additional costs of repair to the levees have ranged from \$10,000 to \$18,000. Given the cost of the floodgate project, \$155,000, which was \$20,000 less than initially budgeted, one can appreciate the sentiment expressed by SFCD Commissioner Chuck Hazleton: "It was definitely money well spent."

Activity/Project Location

Geographical Area: **Single County in a State**

FEMA Region: **Region X**

State: **Washington**

County: **Snohomish County**

City/Community: **Stanwood**

Key Activity/Project Information

Sector: **Public**

Hazard Type: **Flooding**

Activity/Project Type: **Flood Control**

Activity/Project Start Date: **01/2005**

Activity/Project End Date: **09/2007**

Funding Source: **Hazard Mitigation Grant Program (HMGP); Local Sources**

Application/Project Number: **unknown**

Activity/Project Economic Analysis

Cost: **\$155,000.00 (Estimated)**

Activity/Project Disaster Information

Mitigation Resulted From Federal
Disaster? **Unknown**

Value Tested By Disaster? **Yes**

Tested By Federal Disaster #: **1817 , 01/30/2009; 1825 , 03/02/2009**

Repetitive Loss Property? **Unknown**

Reference URLs

No URLs were submitted

Main Points

No Main Points were entered.



The "Old Stilly Gate" draining away floodwater south of Stanwood, 2 pm Friday, January 9, 2009.



After the flood (February 21, 2009)